

Of advantage in accordance with the invention here are Taylor reactors having an external reactor wall located within which there is a concentrically or eccentrically disposed rotor, a reactor floor, and a reactor lid, which together define the annular reactor volume, at least one means for metered addition of reactants, and a means for the discharge of product, where the reactor wall and/or the rotor are or is geometrically designed in such a way that the conditions for Taylor flow are met over substantially the entire reactor length in the reactor volume, i.e., in such a way that the annular gap broadens in the direction of flow traversal.

The monomers for combination are selected in accordance with the requirements of the intended use, so that the coating materials cured by actinic radiation, especially UV light, satisfy the requirements imposed. The basic principles when selecting and blending monomers for adjusting base properties in coating materials and the coatings produced using them, especially surface coatings, are known to the polymer chemist and coatings expert.

These requirements may differ considerably; for clear topcoats of metallic finishes in automobiles, for example, extremely high yellowing resistance and weathering stability, scratch resistance and gloss

retention coupled with a high level of hardness are required. In the case of a coil coating material, i.e., a coating material which is used to coat metal sheets which are then wound up and later processed further with deformation, the important factors are very high elasticity and adhesion.

The price of the monomers as well may be a selection criterion if certain applications do not require high coating quality but do require a low price.

For example, the hardness, glass transition temperature, and softening point of the polyacrylates (A) may be increased by using higher fractions of "hard" monomers, such as styrene or the (meth)acrylates of C1 to C3 alcohols, whereas, for example, butyl acrylate, ethylhexyl acrylate or tridecyl acrylate, as "soft" monomers, lower these temperatures but at the same time improve the elasticity. Furthermore, it is also known that minor fractions of copolymerized (meth)acrylic acid or copolymerized (meth)acrylamide improve the adhesion.

The influences of the molecular weight and of the molecular weight distribution, and the control of the polymerization by means of regulators, temperature

sensing, and catalyst selection are also prior art known to the skilled worker.

Examples of suitable monomers for synthesizing  
5 polyacrylates (A) are the esters of acrylic acid and  
methacrylic acid with aliphatic, cycloaliphatic,  
araliphatic and aromatic alcohols having from 1 to 40  
carbon atoms such as methyl (meth)acrylate, ethyl  
(meth)acrylate, propyl (meth)acrylate, isopropyl  
10 (meth)acrylate, n-butyl (meth)acrylate, isobutyl  
(meth)acrylate, tert-butyl (meth)acrylate, amyl  
(meth)acrylate, isoamyl (meth)acrylate, hexyl  
(meth)acrylate, 2-ethylhexyl (meth)acrylate, decyl  
(meth)acrylate, undecyl (meth)acrylate, dodecyl  
15 (meth)acrylate, tridecyl (meth)acrylate, cyclohexyl  
(meth)acrylate, methylcyclohexyl (meth)acrylate, benzyl  
(meth)acrylate, tetrahydrofurfuryl (meth)acrylate or  
furfuryl (meth)acrylate; the esters of 3-phenylacrylic  
acid and the various isomeric forms thereof, e.g.,  
20 methyl cinnamate, ethyl cinnamate, butyl cinnamate,  
benzyl cinnamate, cyclohexyl cinnamate, isoamyl  
cinnamate, tetrahydrofurfuryl cinnamate or furfuryl  
cinnamate; acrylamide, methacrylamide, methylol-  
acrylamide or methylolmethacrylamide; acrylic acid,  
25 methacrylic acid or 3-phenylacrylic acid; hydroxyalkyl  
(meth)acrylates such as ethyl glycol mono(meth)-  
acrylate, butyl glycol mono(meth)acrylate or hexanediol